INSTRUCTIONS

ENGINE CRANKCASE PRESSURE SWITCH

GE 7FDL ENGINES

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FIG. 1, E-21624

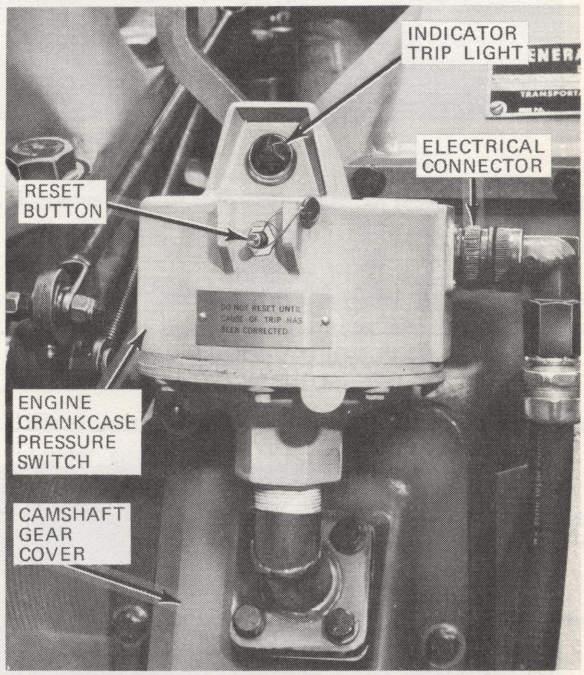


FIG. 1. ENGINE CRANKCASE PRESSURE SWITCH MOUNTED ON ENGINE.

GENERAL

The crankcase overpressure switch protects the engine in case of excessive crankcase pressure. In normal operation, there is a slight vacuum in the engine crankcase; if a pressure of 1.9 to 2.1 in. of water builds up in the crankcase, the switch will trip and shut down the engine. A red indicating light is provided on the device, and also in the operating cab, to inform the operator when the switch is tripped. The switch can be reset by pushing the manual reset button located beneath the indicating light. See Fig. 1.

The device consists of a diaphragm, control plate, and the trigger-bar assembly, all housed in a cast-aluminum housing. See Fig. 2. The switch is mounted on the left-side generator end of the engine. See Fig. 1.

TESTING ON LOCOMOTIVE

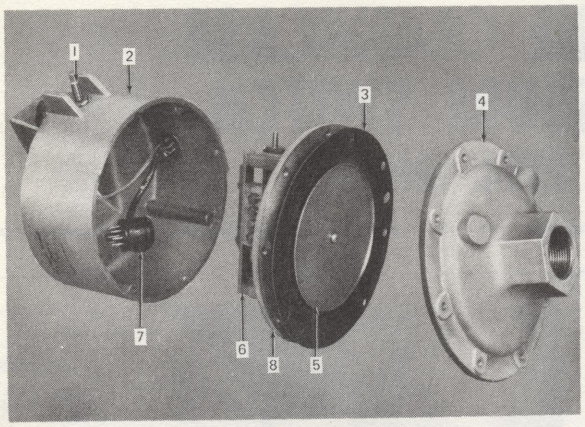
MECHANICAL

Using the test kit shown in Fig. 3 or Fig. 4, check the tripping pressure of the switch. This should be 1.9 to 2.1 in. of water.

1. With the engine shutdown, hang the manometer or the differential pressure gage in a convenient place close to the pressure switch.
2. Firmly push in on the reset button to be sure the switch is in the RESET, or normal-operating, position.
3. When using test kit, Part 147X1475, hold the short piece of rubber tubing tightly against the vent hole in the control plate. See Fig. 7. Then slowly work the rubber bulb to draw air from the upper side of the diaphragm.

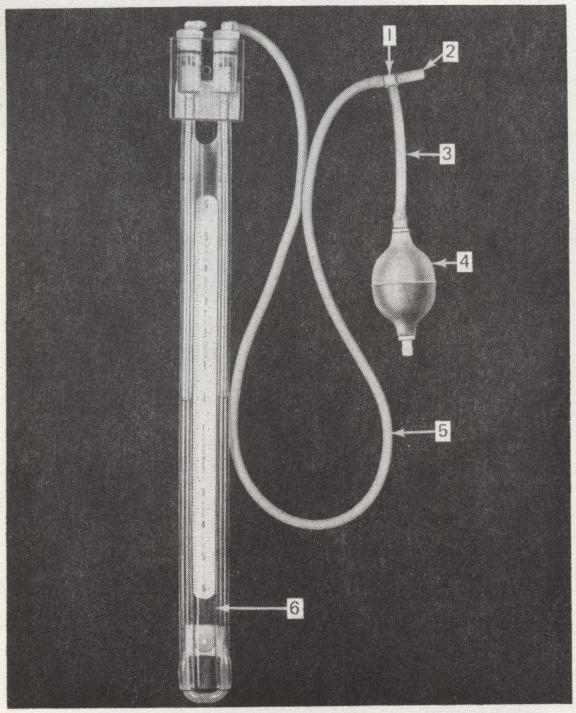
These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

Verify numbers for parts, tools, or material by using the Renewal Parts or Tool Catalogs, or contact your General Electric representative for assistance. Do not order from this publication.



REF.	DESCRIPTION
1	RESET BUTTON
2	TOP COVER
3	DIAPHRAGM
4	BOTTOM HOUSING
5	DIAPHRAGM FOLLOWER PLATE
6	TRIGGER BAR ASSEMBLY
7	ELECTRICAL CONNECTOR (INTERNAL)
8	CONTROL PLATE

FIG. 2. EXPLODED VIEW OF CRANKCASE PRESSURE SWITCH.



REF.	DESCRIPTION
1	PLASTIC TEE
2	RUBBER TUBING, 3/16 IN. I.D., 1/2 IN. LONG
3	RUBBER TUBING, 3/16 IN. I.D., 5 IN. LONG
4	RUBBER BULB (DOUBLE ACTING)
5	RUBBER TUBING, 3/16 IN. I.D., 18 IN. LONG
6	MANOMETER 12 IN.

FIG. 3. ASSEMBLED TEST KIT, PART 147X1475, FOR CHECKING CRANKCASE PRESSURE SWITCH.

4. When using test kit, Part 147X1995, squeeze the plastic bottle to expel most of the air from within the bottle, then insert the plastic tip into the vent hole in the control plate. See Fig. 4. Then allow the plastic bottle to expand and, in so doing, draw air from the upper side of the diaphragm.

5. Observe the indication on the manometer or the differential pressure gage when the switch begins to trip.

6. If indication is outside the correct tripping limits, replace the switch with a new or rebuilt switch.

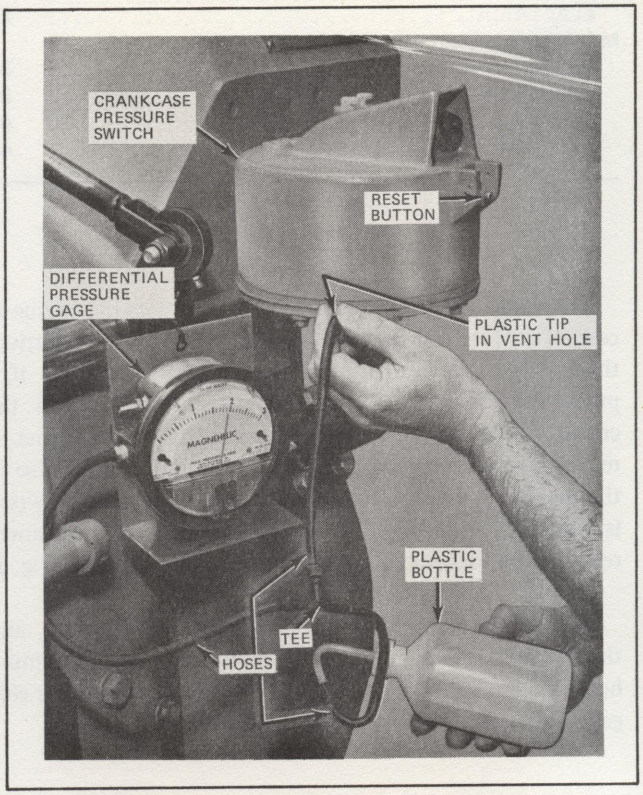


FIG. 4. CHECKING CRANKCASE PRESSURE SWITCH WITH TEST KIT, PART 147X1995.

ELECTRICAL

Disconnect the receptacle from the plug connector at the switch, so the pins in the plug connector are made accessible. Position the switch in both the RESET, or normal-operating, and TRIPPED position. Using a test light or ohmmeter, check the internal circuitry of the switch. Refer to Figs. 5, 6 and Table I. The switch can be tripped by drawing a slight vacuum at the vent hole (Figs. 7 and 8); it is reset by firmly depressing the reset button (Figs. 1 and 9).

FIG. 2, E-14837A
FIG. 3, E-14841
FIG. 4, E-21627

FIG. 5, E-21628

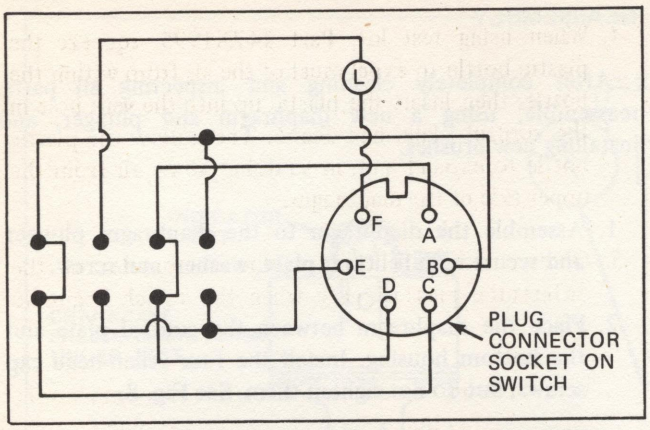


FIG. 5. INTERNAL WIRING DIAGRAM OF SWITCH — SHOWN IN RESET POSITION.

FIG. 6, E-21629

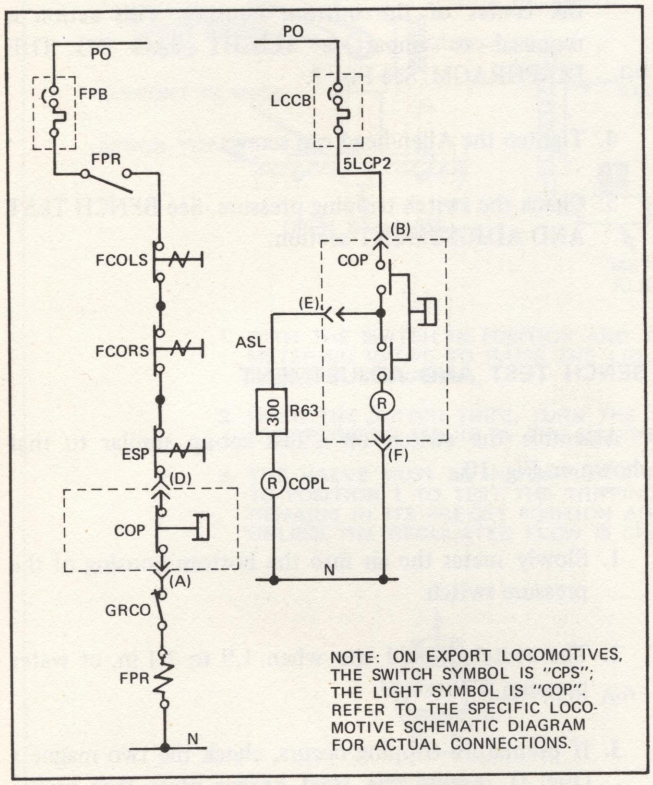


FIG. 6. TYPICAL LOCOMOTIVE SCHEMATIC DIAGRAM (PARTIAL) SHOWING CRANKCASE PRESSURE SWITCH CONNECTIONS.

FIG. 7, E-14838A

TABLE I, CONTINUITY CHECK

PINS	CIRCUIT CONDITION WITH SWITCH IN POSITION:	
	RESET	TRIPPED
D-A	Closed	Open
B-E	Open	Closed
B-F	Open	Closed*

*If open check pilot light bulb on the switch.

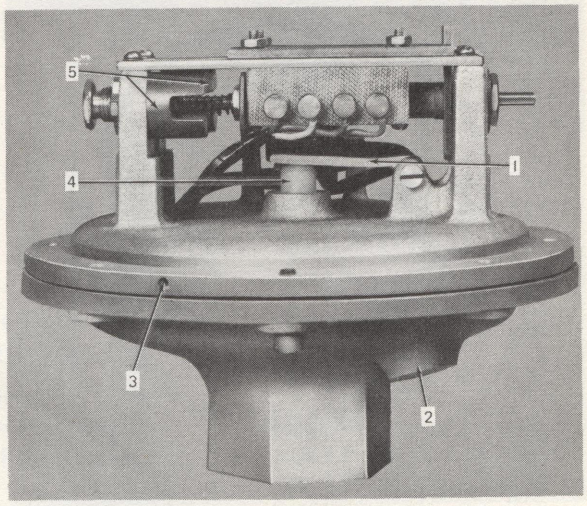
MAINTENANCE

INSPECTION

Remove the crankcase pressure switch from the engine, and make a complete visual inspection of the unit. Check the quick-disconnect electrical connection and the indicator-light bulb, and inspect the housing for breaks or cracks.

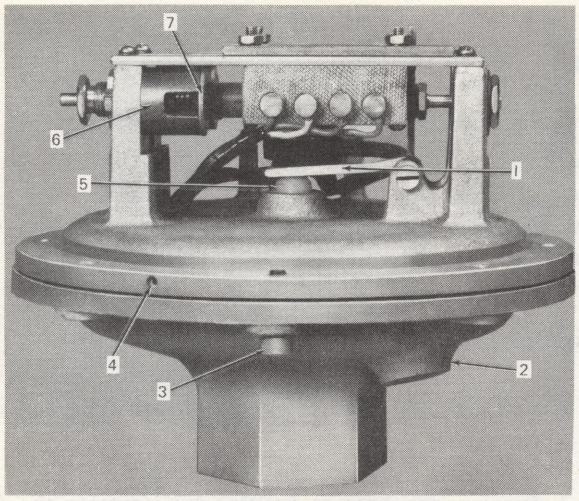
DISASSEMBLY

1. Remove the top cover by removing the four hex-head cap screws.
2. Remove the bottom housing by removing the four Allen-head cap screws. See Fig. 8.
3. Normally, this should be the extent of the disassembly unless examination reveals damage to additional parts which must be replaced.
4. It is recommended that the diaphragm, the diaphragm plunger, and the eight brushes be renewed.
5. Clean the switch, making sure there are no carbon tracks on the armature. See Fig. 9.



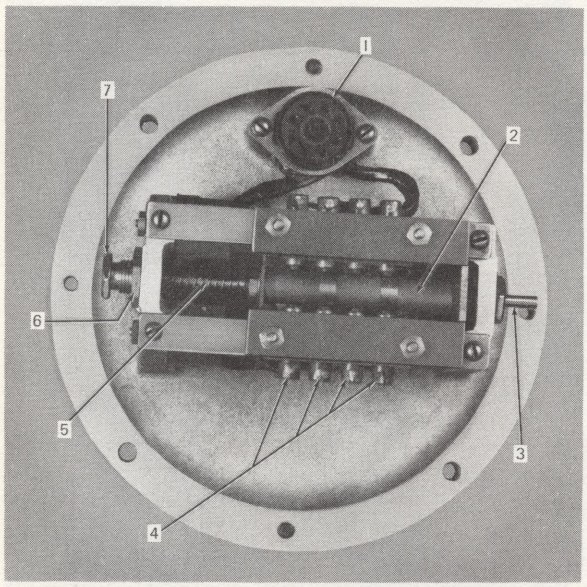
REF.	DESCRIPTION
1	TRIP ARM
2	BOTTOM HOUSING
3	VENT HOLE (IN CONTROL PLATE)
4	DIAPHRAGM PLUNGER
5	MAGNETS

FIG. 7. SIDE VIEW OF CRANKCASE PRESSURE SWITCH, TOP COVER REMOVED (TRIPPED POSITION).



REF.	DESCRIPTION
1	TRIP ARM
2	BOTTOM HOUSING
3	ALLEN SCREW
4	VENT HOLE (IN CONTROL PLATE)
5	DIAPHRAGM PLUNGER
6	MAGNETS
7	STEEL KEEPER PLATE

FIG. 8. SIDE VIEW OF CRANKCASE PRESSURE SWITCH, TOP COVER REMOVED (NORMAL OPERATING POSITION).



REF.	DESCRIPTION
1	ELECTRICAL CONNECTOR (INTERNAL)
2	ARMATURE
3	RESET BUTTON
4	BRUSHES (8)
5	TENSION SPRING
6	ADJUSTMENT SCREW LOCKNUT
7	ADJUSTMENT SCREW

FIG. 9. OVERHEAD VIEW OF CRANKCASE PRESSURE SWITCH, TOP COVER REMOVED.

REASSEMBLY

After completely cleaning and inspecting all parts, reassemble, using a new diaphragm and plunger, and installing new brushes.

1. Assemble the diaphragm to the diaphragm plunger and secure with follower plate, washer, and screw.
2. Place the diaphragm between the control plate and the bottom housing. Install the four Allen-head cap screws, but do not tighten them. See Fig. 8.
3. Exert a slight downward thrust on the diaphragm plunger until it extends approximately 3/8 in. into the center of the bottom housing. This action is required to impart a SLIGHT SAG TO THE DIAPHRAGM. See Fig. 7.
4. Tighten the Allen-head cap screws.
5. Check the switch tripping pressure. See BENCH TEST AND ADJUSTMENT section.

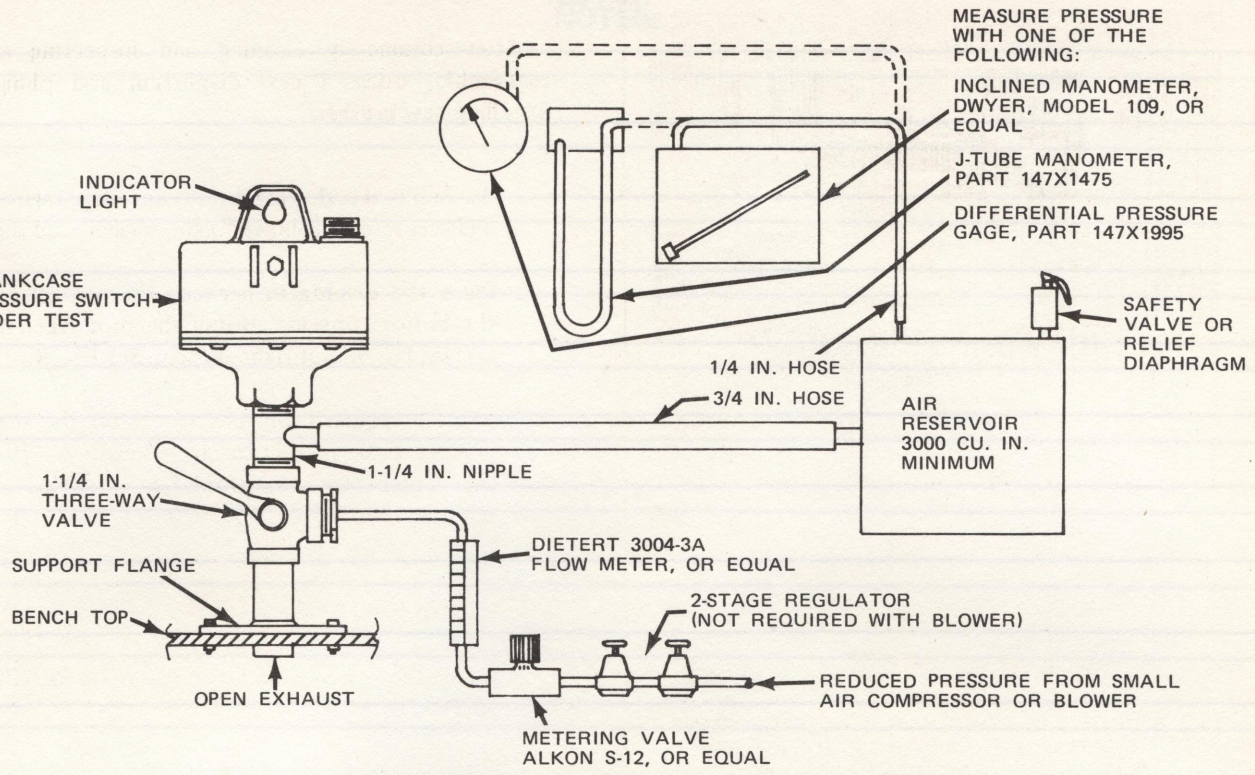
BENCH TEST AND ADJUSTMENT

Assemble the switch on a test set-up similar to that shown on Fig. 10.

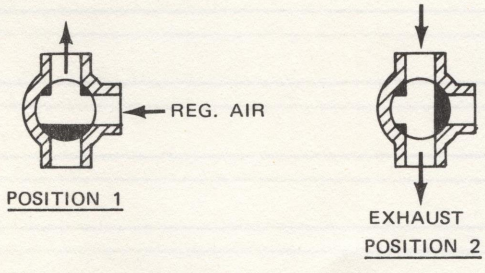
1. Slowly meter the air into the bottom housing of the pressure switch.
2. The switch should trip when 1.9 to 2.1 in. of water pressure is obtained.
3. If premature tripping occurs, check the two magnets (Fig. 7). Assure the steel keeper plate that makes contact with them, in the RESET position, is making firm contact on all four points. Be sure there are no chips or magnetic particles sticking to the magnets.
4. If the magnets and keeper plate are functioning properly and premature tripping still exists, loosen the locknut (Fig. 9) and turn the adjustment screw to decrease the tension on the spring.
5. Turn the adjustment screw until the correct tripping pressure is obtained, then lock the adjustment with the locknut.
6. Replace the top cover of the pressure switch.

FIG. 8, E-14839A

FIG. 9, E-14840A


MEASURE PRESSURE WITH ONE OF THE FOLLOWING:
INCLINED MANOMETER, DWYER, MODEL 109, OR EQUAL
J-TUBE MANOMETER, PART 147X1475
DIFFERENTIAL PRESSURE GAGE, PART 147X1995
INDICATOR LIGHT
CRANKCASE PRESSURE SWITCH UNDER TEST
SAFETY VALVE OR RELIEF DIAPHRAGM
1/4 IN. HOSE
3/4 IN. HOSE
AIR RESERVOIR 3000 CU. IN. MINIMUM
1-1/4 IN. NIPPLE
1-1/4 IN. THREE-WAY VALVE
DIETERT 3004-3A FLOW METER, OR EQUAL
SUPPORT FLANGE
2-STAGE REGULATOR (NOT REQUIRED WITH BLOWER)
BENCH TOP
REDUCED PRESSURE FROM SMALL AIR COMPRESSOR OR BLOWER
OPEN EXHAUST
METERING VALVE ALKON S-12, OR EQUAL

1. WITH THE SWITCH IN POSITION AND THE VALVE IN POSITION 1, OPEN THE METERING VALVE TO RAISE THE LIQUID IN THE MANOMETER AT THE RATE OF 1 IN. PER 6 SECONDS.
2. WHEN THE SWITCH TRIPS, TURN THE VALVE TO POSITION 2. THIS WILL PREVENT OVERFLOWING LIQUID IN THE MANOMETER.
3. THE VALVE MUST BE IN POSITION 2 TO RE-SET THE SWITCH. TURN THE VALVE TO POSITION 1 TO TEST THE TRIPPING PRESSURE. THE METERING VALVE REMAINS IN ITS PRE-SET POSITION AND WILL NOT REQUIRE RE-ADJUSTMENT UNLESS THE REGULATED FLOW IS CHANGED.



THREE-WAY VALVE POSITIONS

FIG. 10, E-21625

FIG. 10. TEST STAND EQUIPMENT FOR CHECKING CRANKCASE PRESSURE SWITCH.